

REMARKS

Claims 1-4, 6-11, 13 and 24 are pending. By this Amendment, claims 12, and 14-22 are cancelled without prejudice to or disclaimer of the subject matter contained therein, claims 1, 3, 6 and 7 are amended to recite features supported in claim 12 as originally filed, and claim 24 is added contains matter formerly found in claim 1. No new matter is added by any of these amendments.

Reconsideration based on the following remarks is respectfully requested.

I. Amendment Entry with Request for Continued Examination

Entry of this amendment is proper under 37 CFR §1.114 because this Submission is filed in conjunction with a Request for Continued Examination. Accordingly, Applicants respectfully request entry of this Amendment.

II. Claims 1-4, 6-11, 13 and 24 Define Patentable Subject Matter

The Final Office Action rejects claims 15 and 18 under 35 U.S.C. §102(b) over “Through-Bond Interactions in Silicon-Phosphorus and Silicon-Arsenic Compounds...” by Winkler *et al.*, *Chemistry—A European Journal*, 3, 874-880. This rejection is rendered moot by the cancellation of claims 15 and 18.

The Final Office Action further rejects claims 1-4, 13-14 and 22 under 35 U.S.C. §103(a) over U.S. Patent 5,989,945 to Yudasaka *et al.* (hereinafter “Yudasaka '945”) in view of U.S. Patent 5,667,572 to Taniguchi *et al.* (hereinafter “Taniguchi”). This rejection is rendered moot with respect to claims 14 and 22, and is respectfully traversed with respect to the remaining claims.

Yudasaka '945 and Taniguchi, alone or in combination, do not teach or suggest a method for forming a silicon film, including providing an ink composition comprising a silicon compound onto a substrate by an ink jet process, wherein the silicon compound is represented by Si_nX_{2n} or $\text{Si}_n\text{X}_{2n-2}$, n representing an integer of 3 or more, and X

representing a hydrogen atom and/or a halogen atom, and evaporating a solvent of the composition to form the silicon film, the concentration of the silicon compound in the composition being in a range of 0.01 to 10 percent by weight so that a uniform coating film is obtained, as recited in claim 1.

Instead, Yudasaka '945 discloses TFT production using polycrystalline silicon. In particular, Yudasaka '945 teaches disposing a layer of insulating films under a gate electrode (col. 11, lines 18-27 and Fig. 4 of Yudasaka '945).

Further, Taniguchi discloses a water-based ink composition. In particular, Taniguchi teaches colorant dye particles and organic solvents for the ink composition (col. 2, lines 25-44 and col. 6, lines 43-56 of Taniguchi).

Further, there is no motivation to combine features related to the TFT processing of Yudasaka '945 with the organic ink composition of Taniguchi, nor has the Final Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicants' claimed features.

The Final Office Action further rejects claims 8, 10-12, 17 and 19-21 under 35 U.S.C. §103(a) over Yudasaka '945 in view of Taniguchi and further in view of Japanese Patent Application JP 06-191821 to Kotaro *et al.* (hereinafter "Kotaro"). This rejection is rendered moot with respect to claims 12, 17 and 19-21, and is respectfully traversed with respect to claims 8, 10 and 11.

Kotaro does not compensate for the deficiencies of Yudasaka '945 and Taniguchi outlined above for claim 1. Nor does Kotaro teach, disclose or suggest the additional features recited in claims 8, 10 and 11. Instead, Kotaro discloses a film coating method using an organic solvent. In particular, Kotaro teaches saturated hydrocarbons, unsaturated hydrocarbons, aromatics and ethers with silane dissolved therein (Abstract of Kotaro).

Specifically, Kotaro discloses the compound $\text{Si}_n\text{X}_{2n+2}$ (claim 1 of Kotaro). Thus, one of ordinary skill in the art would not be expected to modify such teaching to achieve the features recited in claim 1, particularly compounds Si_nX_{2n} or $\text{Si}_n\text{X}_{2n-2}$.

Further, there is no motivation to combine features related to the TFT processing of Yudasaka '945 with the organic ink composition of Taniguchi or the organic solvent of Kotaro, nor has the Final Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicants' claimed features.

The Final Office Action further rejects claims 1-4, 13-14 and 22 under 35 U.S.C. §103(a) over PCT Patent Publication WO97/43689 to Yudasaka *et al.* (hereinafter "Yudasaka '689") in view of Taniguchi. This rejection is rendered moot with respect to claims 14 and 22, and is respectfully traversed with respect to the remaining claims.

Yudasaka '689 and Taniguchi, separately and in combination, also fail to teach or suggest the silicon film forming method recited as above, in claim 1.

Instead, Yudasaka '689 teaches the manufacturing method for a TFT device as described above for Yudasaka '945. Further, there is no motivation to combine features related to the manufacturing method of Yudasaka '689 with the previously explained ink composition of Taniguchi, nor has the Final Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicants' claimed features.

The Final Office Action further rejects claims 8, 10-12, 17 and 19-21 under 35 U.S.C. §103(a) over Yudasaka '689 in view of Taniguchi and Kotaro. This rejection is rendered moot with respect to claims 12, 17 and 19-21, and is respectfully traversed with respect to claims 8, 10 and 11.

Kotaro does not compensate for the deficiencies of Yudasaka '689 and Taniguchi outlined above for claim 1. Nor does Kotaro teach, disclose or suggest the additional features recited in claims 8, 10 and 11, as explained above.

Further, there is no motivation to combine features related to the TFT manufacturing method of Yudasaka '689 with the organic ink composition of Taniguchi or the organic solvent of Kotaro, nor has the Final Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicants' claimed features.

For at least these reasons, Applicants respectfully assert that independent claim 1 is now patentable over the applied references. The dependent claims are likewise patentable over the applied references, including added claim 24, for at least the reasons discussed as well as for the additional features they recite. Consequently, all the pending claims are in condition for allowance. Thus, Applicants respectfully request that the rejections under 35 U.S.C. §§102 and 103 be withdrawn.

III. The Claims Satisfy Obviousness-Type Double Patenting Requirements

The Final Office Action rejects claims 15, 16 and 18 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6 and 9 of co-pending application 09/701,377 issued as U.S. Patent 6,527,847 to Matsuki (hereinafter "Matsuki '847"). This rejection is rendered moot by the cancellation of these claims.

The Final Office Action further rejects claims 6, 7 and 9 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6 and 9 of Matsuki '847 in view of Yudasaka '689. This rejection is respectively traversed.

Yudasaka '689 and the claims of Matsuki '847, alone or in combination, fail to teach or suggest a method for forming a silicon film including applying by patterning an ink

composition containing a silicon compound onto a substrate by an ink jet process; and evaporating a solvent of the composition to form the silicon film, the concentration of the silicon compound in the composition being in a range of 0.01 to 10 percent by weight so that a uniform coating film is obtained, wherein the silicon compound having at least one cyclic structure, the silicon compound is a silicon compound represented by $\text{Si}_a\text{X}_b\text{Y}_c$, X representing a hydrogen atom, Y representing a boron atom or a phosphorus atom, a representing an integer of 3 or more, b representing an integer of a to $2a+c$, and c representing an integer of 1 to a, as recited in claim 6, and similarly recited in claim 7.

Instead, the claims of Matsuki '847 are directed to a coating composition by Si_nX^1_n , with X^1 being a hydrogen or halogen atom, and n being 4 or more. Thus, the formulae for Matsuki '847 lacks any teaching or suggestion for a compound including hydrogen and either boron or phosphorus (neither of which are halogens). Further, by reciting Si and X^1 as having the same number of $n \geq 4$ atoms, the claims of Matsuki '847 teach away from Applicants' compound containing $a \geq 3$ silicon atoms, $a \leq b \leq 2a+c$ hydrogen atoms, and $1 \leq c \leq a$ boron or phosphorus atoms, as recited in claims 6 and 7. Nor is there any motivation to combine the TFT manufacturing method of Yudasaka '689, as explained above, with the coating composition of Matsuki '847. These reasons apply by extension to claim 9 on the basis of dependency from claim 6.

The Final Office Action further rejects claims 1-4, 8, 12-14, 17, 21 and 22 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6 and 9 of Matsuki '847 in view of Yudasaka '689 and Taniguchi. The Final Office Action further rejects claims 10-12 and 19-21 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 6 and 9 of Matsuki '847 in view of Yudasaka '689 and Taniguchi and in view of Kotaro. These rejections are

rendered moot with respect to claims 12 and 14, 17 and 19-22, and are respectfully traversed for the remaining claims 1-4, 8, 10, 11 and 13.

As explained above, the claims of Matsuki '847 are directed to a coating composition of Si_nX^1_n , with X^1 being a hydrogen or halogen atom, with $n \geq 4$. In contrast, Applicants' claimed features include the silicon compound is represented by Si_nX_{2n} or $\text{Si}_n\text{X}_{2n-2}$, n representing an integer of 3 or more, and X representing a hydrogen atom and/or a halogen atom, as recited in claim 1.

Thus, Applicants' claims permit fewer silicon atoms and up to double the number of hydrogen or halogen atoms as silicon atoms than claimed in Matsuki '847. Thus, one of ordinary skill in the art would not find motivation to modify the teachings of Matsuki '847 to achieve Applicants' claimed features. Further, Yudasaka '689, Taniguchi and Kotaro do not compensate for the deficiencies of Matsuki '847, for the reasons explained above. These reasons also extend to claims 2-4, 8, 10, 11 and 13 based on dependence from claim 1.

The Final Office Action further rejects claims 1, 3, 8, 12-14, 17, 21 and 22 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 15 of co-pending application 09/802,908 issued as U.S. Patent 6,503,570 to Matsuki *et al.* (hereinafter "Matsuki '570"). The Final Office Action rejects further claims 2 and 4 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 15 of Matsuki '570 in view of Yudasaka '689 and Taniguchi. The Final Office Action rejects further claims 10, 11, 19 and 20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 and 15 of Matsuki '570 in view of Taniguchi and further in view of Kotaro. These rejections are rendered moot with respect to claims 12 and 14, 17 and 19-22, and are respectfully traversed for the remaining claims 1-4, 8, 10, 11 and 13.

The claims of Matsuki '570 are directed to a cyclopentasilane compound film of a ring Si_5H_{10} . In contrast, Applicants' claimed features include the silicon compound is represented by Si_nX_{2n} or $\text{Si}_n\text{X}_{2n-2}$, n representing an integer of 3 or more, and X representing a hydrogen atom and/or a halogen atom, as recited in claim 1. Thus, Applicants' claims permit fewer silicon atoms and two fewer than double the number of halogen atoms (or even hydrogen atoms) as silicon atoms than claimed in Matsuki '570. Thus, one of ordinary skill in the art would not find motivation to modify the teachings of Matsuki '570 to achieve Applicants' claimed features. Further, Yudasaka '689, Taniguchi and Kotaro do not compensate for the deficiencies of Matsuki '570, for reasons as explained above.

Obviousness-type double patenting requires rejection of an application claim when the claimed subject matter is not patentably distinct from the subject matter claimed in a commonly owned patent. Thus, to establish *prima facie* obviousness, all the claim limitations must be taught or suggested by the prior art (MPEP §2143.03). Applicants respectfully assert that the Final Office Action does not satisfy these requirements with either Matsuki '847 or Matsuki '570, in combination with Yudasaka '689, Taniguchi and Kotaro. Thus, Applicants respectfully submit that the double-patenting rejections are improper and should be withdrawn.

IV. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Gerhard W. Thielman
Registration No. 43,186

JAO:GWT/gwt

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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